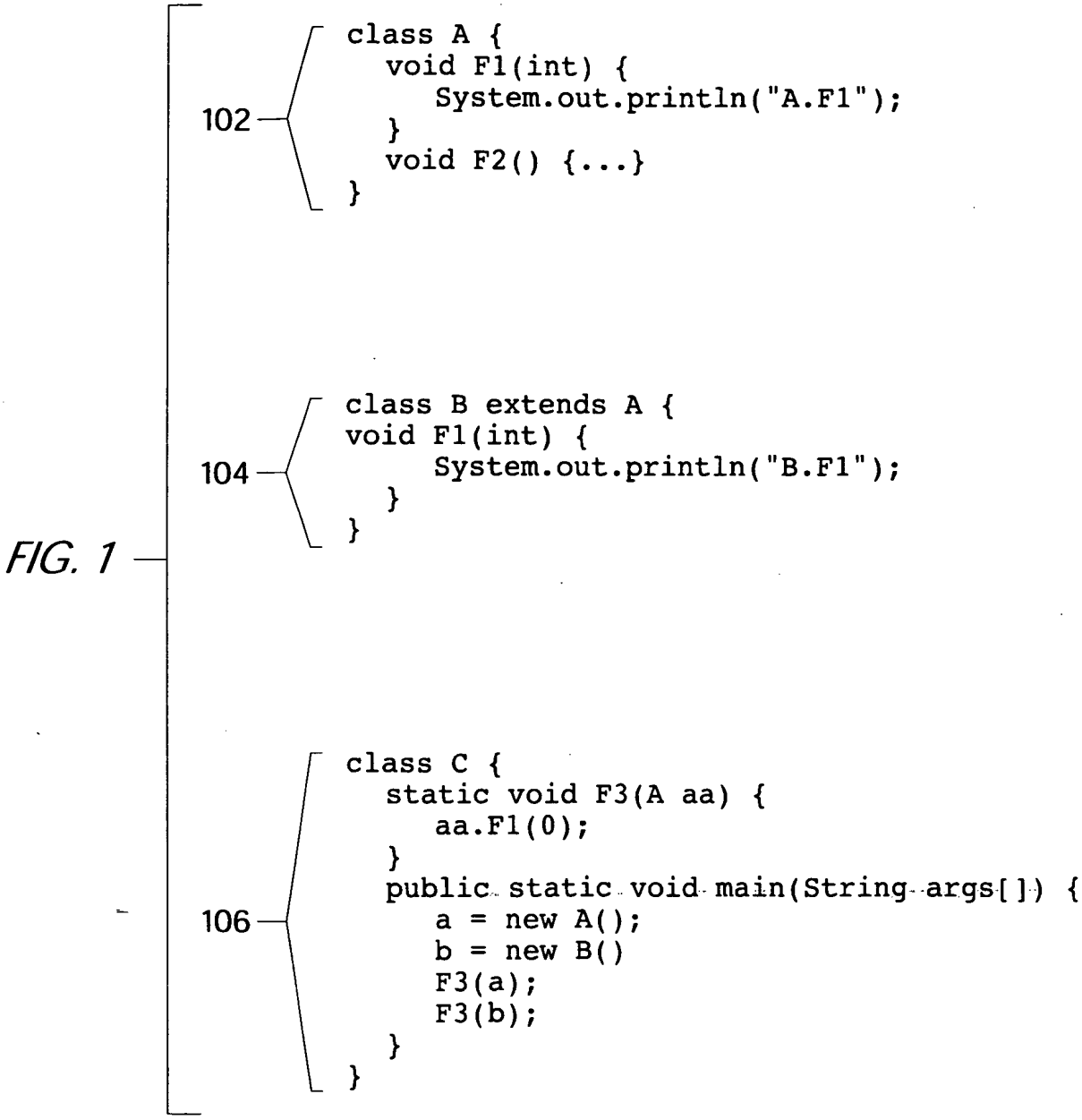
5,966,536

FIG. 1



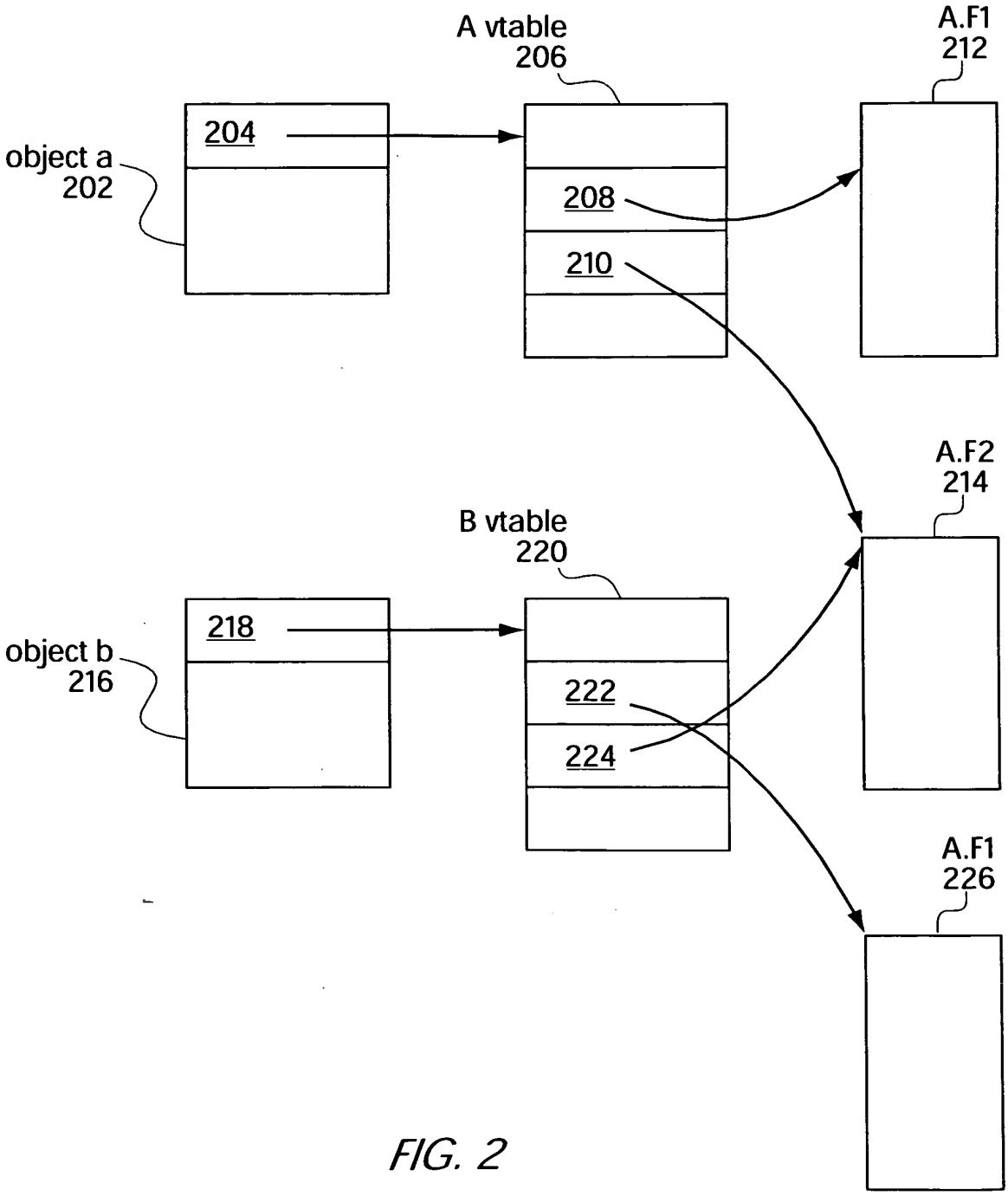

A vtable
206
A.F1
212
204
object a
202
208
210
A.F2
214
B vtable
220
218
object b
216
222
224
A.F1
226

FIG. 2

Exhibit 1002 - Page 0050

FIG. 3

302
```
interface D {
     void G1 (int);
     float G2(float, int);
}
```

304
```
interface E{
  void G1 (int);
  void G3 (int);
}
```

306
```
class F implements D {
  void G4();
  void G1() {
     System.out.println(F.G1);
  }
  float G2(float, int);
}
```

308
```
class G implements D, E {
  void G1() {
     System.out.println(G.G1);
  }
  void G3(int);
  float G2(float, int);
}
```

FIG. 3B

310
```
class H {
  static void G4 (D d) {
     d.G1(0);
  }
  public static void main (String args[]) {
     f = new F();
     g = new G();
     G4 ((D)f);
     G4 ((D)g);
  }
}
```

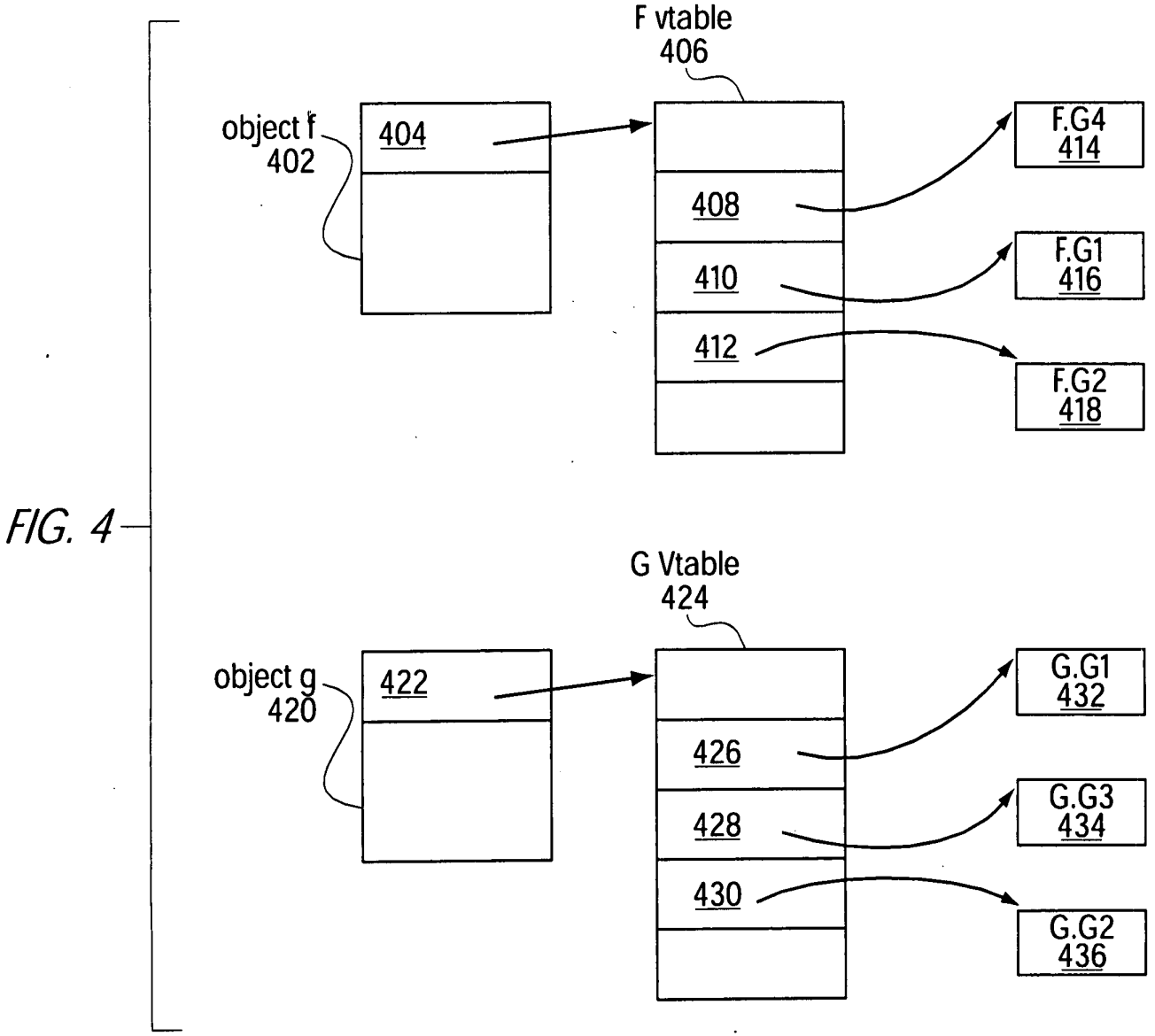

F vtable
406
object f
402
404
408
410
412
F.G4
414
F.G1
416
F.G2
418
G Vtable
424
object g
420
422
426
428
430
G.G1
432
G.G3
434
G.G2
436

FIG. 4

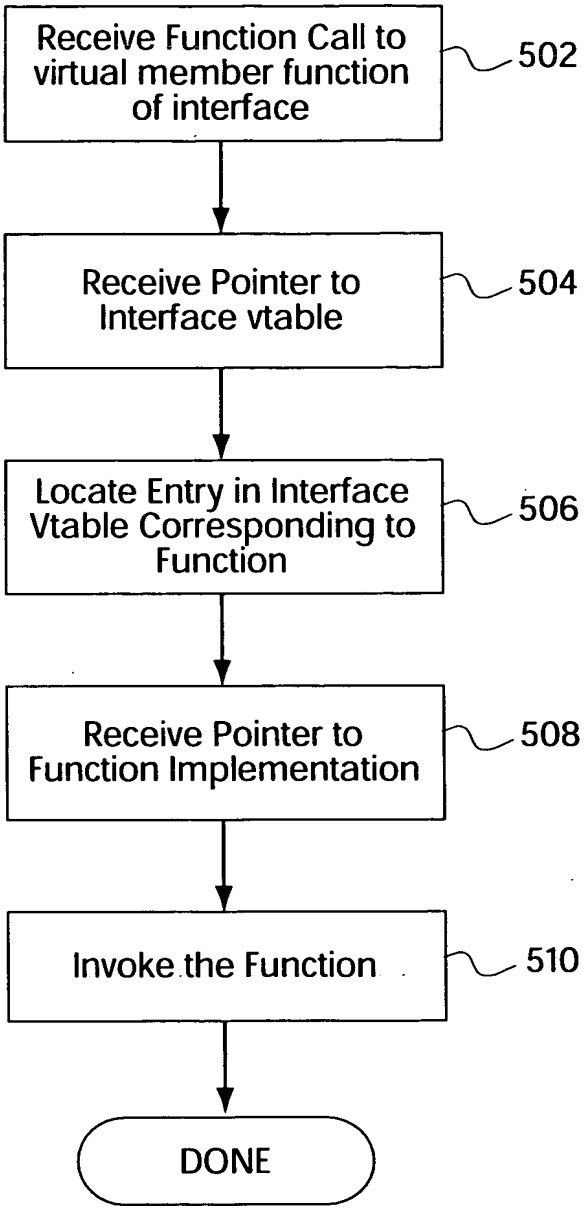

Receive Function Call to virtual member function of interface
502
Receive Pointer to Interface vtable
504
Locate Entry in Interface Vtable Corresponding to Function
506
Receive Pointer to Function Implementation
508
Invoke the Function
510
DONE

FIG. 5

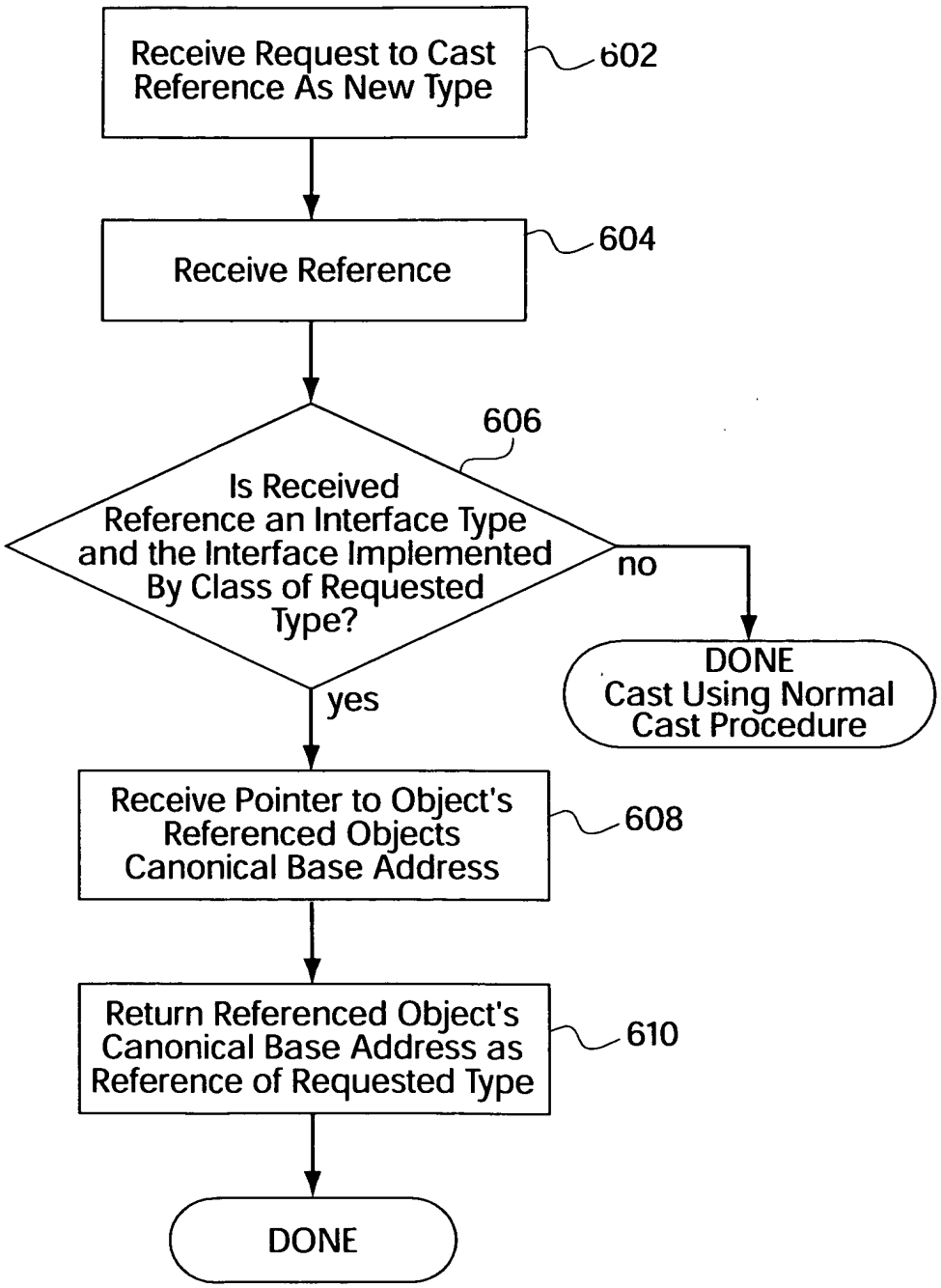

Receive Request to Cast Reference As New Type
602
Receive Reference
604
606
Is Received Reference an Interface Type and the Interface Implemented By Class of Requested Type?
no
DONE Cast Using Normal Cast Procedure
yes
Receive Pointer to Object's Referenced Objects Canonical Base Address
608
Return Referenced Object's Canonical Base Address as Reference of Requested Type
610
DONE

FIG. 6

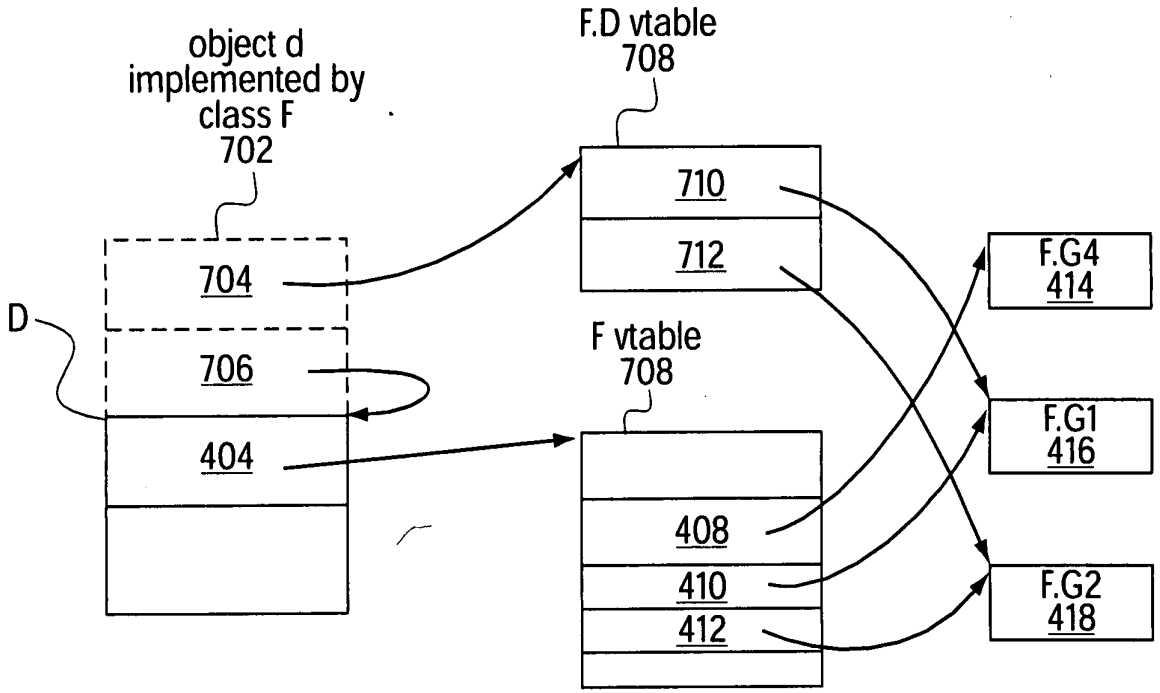

object d
implemented by
class F
702
704
706
404
D
F.D vtable
708
710
712
F vtable
708
408
410
412
F.G4
414
F.G1
416
F.G2
418

FIG. 7a

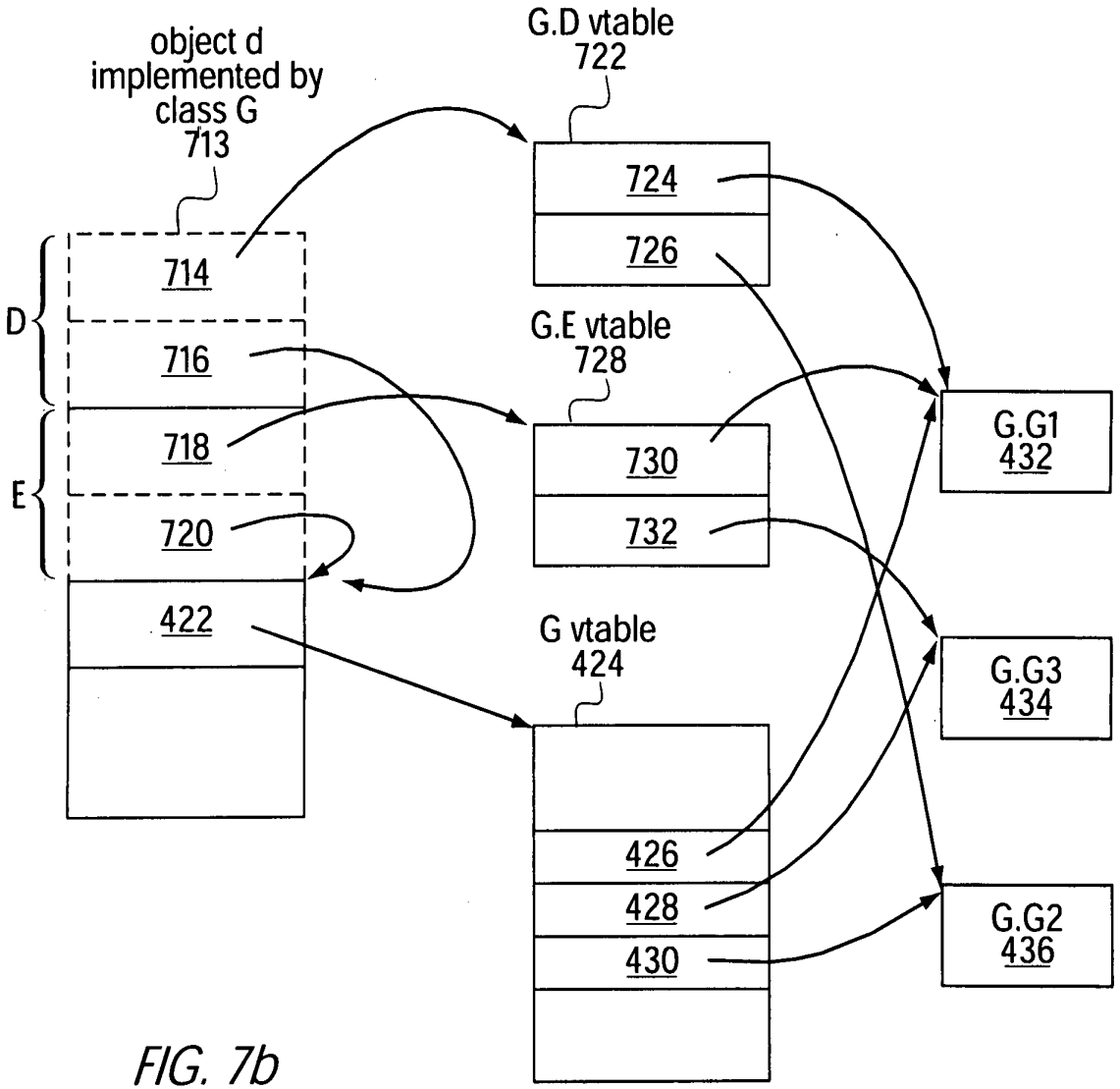

object d
implemented by
class G
713
714
716
718
720
422
D
E
G.D vtable
722
724
726
G.E vtable
728
730
732
G vtable
424
426
428
430
G.G1
432
G.G3
434
G.G2
436

FIG. 7b